

111TH CONGRESS  
1ST SESSION

# H. R. 554

To authorize activities for support of nanotechnology research and development, and for other purposes.

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## IN THE HOUSE OF REPRESENTATIVES

JANUARY 15, 2009

Mr. GORDON of Tennessee (for himself, Mr. HALL of Texas, Mr. BAIRD, Mr. EHLERS, Ms. EDDIE BERNICE JOHNSON of Texas, Mr. SENSENBRENNER, Mr. WU, Mr. SMITH of Texas, Mr. MILLER of North Carolina, Mr. LUCAS, Mr. LIPINSKI, Mr. MCCAUL, Mr. ROTHMAN of New Jersey, Mr. AKIN, Mr. WILSON of Ohio, Mr. BARTLETT, Mr. HONDA, Mr. INGLES, Ms. GIFFORDS, Mrs. BIGGERT, Mr. CARNAHAN, and Mr. MARIO DIAZ-BALART of Florida) introduced the following bill; which was referred to the Committee on Science and Technology

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## A BILL

To authorize activities for support of nanotechnology research and development, and for other purposes.

1       *Be it enacted by the Senate and House of Representa-*  
2       *tives of the United States of America in Congress assembled,*

3       **SECTION 1. SHORT TITLE.**

4       This Act may be cited as the “National Nanotechnol-  
5       ogy Initiative Amendments Act of 2009”.

1 **SEC. 2. NATIONAL NANOTECHNOLOGY PROGRAM AMEND-**  
2 **MENTS.**

3 The 21st Century Nanotechnology Research and De-  
4 velopment Act (15 U.S.C. 7501 et seq.) is amended—

5 (1) by striking section 2(c)(4) and inserting the  
6 following new paragraph:

7 “(4) develop, within 12 months after the date  
8 of enactment of the National Nanotechnology Initia-  
9 tive Amendments Act of 2009, and update every 3  
10 years thereafter, a strategic plan to guide the activi-  
11 ties described under subsection (b) that specifies  
12 near-term and long-term objectives for the Program,  
13 the anticipated time frame for achieving the near-  
14 term objectives, and the metrics to be used for as-  
15 sessing progress toward the objectives, and that de-  
16 scribes—

17 “(A) how the Program will move results  
18 out of the laboratory and into applications for  
19 the benefit of society, including through co-  
20 operation and collaborations with nanotechnol-  
21 ogy research, development, and technology tran-  
22 sition initiatives supported by the States;

23 “(B) how the Program will encourage and  
24 support interdisciplinary research and develop-  
25 ment in nanotechnology; and

“(C) proposed research in areas of national importance in accordance with the requirements of section 5 of the National Nanotechnology Initiative Amendments Act of 2009;”;

(2) in section 2—

(A) in subsection (d)—

(i) by redesignating paragraphs (1) through (5) as paragraphs (2) through (6), respectively; and

(ii) by inserting the following new paragraph before paragraph (2), as so redesignated by clause (i) of this subparagraph:

“(1) the Program budget, for the previous fiscal year, for each agency that participates in the Program, including a breakout of spending for the development and acquisition of research facilities and instrumentation, for each program component area, and for all activities pursuant to subsection (b)(10);”;

(B) by inserting at the end the following new subsection:

“(e) STANDARDS SETTING.—The agencies participating in the Program shall support the activities of committees involved in the development of standards for nano-

1 technology and may reimburse the travel costs of scientists  
2 and engineers who participate in activities of such commit-  
3 tees.”;

4 (3) by striking section 3(b) and inserting the  
5 following new subsection:

6 “(b) FUNDING.—(1) The operation of the National  
7 Nanotechnology Coordination Office shall be supported by  
8 funds from each agency participating in the Program. The  
9 portion of such Office’s total budget provided by each  
10 agency for each fiscal year shall be in the same proportion  
11 as the agency’s share of the total budget for the Program  
12 for the previous fiscal year, as specified in the report re-  
13 quired under section 2(d)(1).

14 “(2) The annual report under section 2(d) shall in-  
15 clude—

16 “(A) a description of the funding required by  
17 the National Nanotechnology Coordination Office to  
18 perform the functions specified under subsection (a)  
19 for the next fiscal year by category of activity, in-  
20 cluding the funding required to carry out the re-  
21 quirements of section 2(b)(10)(D), subsection (d) of  
22 this section, and section 5;

23 “(B) a description of the funding required by  
24 such Office to perform the functions specified under  
25 subsection (a) for the current fiscal year by category

1 of activity, including the funding required to carry  
2 out the requirements of subsection (d); and

3 “(C) the amount of funding provided for such  
4 Office for the current fiscal year by each agency par-  
5 ticipating in the Program.”;

6 (4) by inserting at the end of section 3 the fol-  
7 lowing new subsection:

8 “(d) PUBLIC INFORMATION.—(1) The National  
9 Nanotechnology Coordination Office shall develop and  
10 maintain a database accessible by the public of projects  
11 funded under the Environmental, Health, and Safety, the  
12 Education and Societal Dimensions, and the Nanomanu-  
13 facturing program component areas, or any successor pro-  
14 gram component areas, including a description of each  
15 project, its source of funding by agency, and its funding  
16 history. For the Environmental, Health, and Safety pro-  
17 gram component area, or any successor program compo-  
18 nent area, projects shall be grouped by major objective as  
19 defined by the research plan required under section 3(b)  
20 of the National Nanotechnology Initiative Amendments  
21 Act of 2009. For the Education and Societal Dimensions  
22 program component area, or any successor program com-  
23 ponent area, the projects shall be grouped in subcategories  
24 of—

25 “(A) education in formal settings;

1 “(B) education in informal settings;

2 “(C) public outreach; and

3 “(D) ethical, legal, and other societal issues.

4 “(2) The National Nanotechnology Coordination Of-  
5 fice shall develop, maintain, and publicize information on  
6 nanotechnology facilities supported under the Program,  
7 and may include information on nanotechnology facilities  
8 supported by the States, that are accessible for use by in-  
9 dividuals from academic institutions and from industry.  
10 The information shall include at a minimum the terms and  
11 conditions for the use of each facility, a description of the  
12 capabilities of the instruments and equipment available for  
13 use at the facility, and a description of the technical sup-  
14 port available to assist users of the facility.”;

15 (5) in section 4(a)—

16 (A) by striking “or designate”;

17 (B) by inserting “as a distinct entity”  
18 after “Advisory Panel”; and

19 (C) by inserting at the end “The Advisory  
20 Panel shall form a subpanel with membership  
21 having specific qualifications tailored to enable  
22 it to carry out the requirements of subsection  
23 (c)(7).”;

24 (6) in section 4(b)—

1 (A) by striking “or designated” and “or  
2 designating”; and

3 (B) by adding at the end the following:  
4 “At least one member of the Advisory Panel  
5 shall be an individual employed by and rep-  
6 resenting a minority-serving institution.”;

7 (7) by amending section 5 to read as follows:

8 **“SEC. 5. TRIENNIAL EXTERNAL REVIEW OF THE NATIONAL**  
9 **NANOTECHNOLOGY PROGRAM.**

10 “(a) IN GENERAL.—The Director of the National  
11 Nanotechnology Coordination Office shall enter into an ar-  
12 rangement with the National Research Council of the Na-  
13 tional Academy of Sciences to conduct a triennial review  
14 of the Program. The Director shall ensure that the ar-  
15 rangement with the National Research Council is con-  
16 cluded in order to allow sufficient time for the reporting  
17 requirements of subsection (b) to be satisfied. Each tri-  
18 ennial review shall include an evaluation of the—

19 “(1) research priorities and technical content of  
20 the Program, including whether the allocation of  
21 funding among program component areas, as des-  
22 ignated according to section 2(c)(2), is appropriate;

23 “(2) effectiveness of the Program’s manage-  
24 ment and coordination across agencies and dis-

1 ciplines, including an assessment of the effectiveness  
2 of the National Nanotechnology Coordination Office;

3 “(3) Program’s scientific and technological ac-  
4 complishments and its success in transferring tech-  
5 nology to the private sector; and

6 “(4) adequacy of the Program’s activities ad-  
7 dressing ethical, legal, environmental, and other ap-  
8 propriate societal concerns, including human health  
9 concerns.

10 “(b) EVALUATION TO BE TRANSMITTED TO CON-  
11 GRESS.—The National Research Council shall document  
12 the results of each triennial review carried out in accord-  
13 ance with subsection (a) in a report that includes any rec-  
14 ommendations for ways to improve the Program’s man-  
15 agement and coordination processes and for changes to  
16 the Program’s objectives, funding priorities, and technical  
17 content. Each report shall be submitted to the Director  
18 of the National Nanotechnology Coordination Office, who  
19 shall transmit it to the Advisory Panel, the Committee on  
20 Commerce, Science, and Transportation of the Senate,  
21 and the Committee on Science and Technology of the  
22 House of Representatives not later than September 30 of  
23 every third year, with the first report due September 30,  
24 2010.



1       “(c) FUNDING.—Of the amounts provided in accord-  
 2       ance with section 3(b)(1), the following amounts shall be  
 3       available to carry out this section:

4               “(1) \$500,000 for fiscal year 2010.

5               “(2) \$500,000 for fiscal year 2011.

6               “(3) \$500,000 for fiscal year 2012.”; and

7               (8) in section 10—

8                       (A) by amending paragraph (2) to read as  
 9       follows:

10               “(2) NANOTECHNOLOGY.—The term ‘nanotech-  
 11       nology’ means the science and technology that will  
 12       enable one to understand, measure, manipulate, and  
 13       manufacture at the nanoscale, aimed at creating ma-  
 14       terials, devices, and systems with fundamentally new  
 15       properties or functions.”; and

16                       (B) by adding at the end the following new  
 17       paragraph:

18               “(7) NANOSCALE.—The term ‘nanoscale’ means  
 19       one or more dimensions of between approximately 1  
 20       and 100 nanometers.”.

21       **SEC. 3. SOCIETAL DIMENSIONS OF NANOTECHNOLOGY.**

22       (a) COORDINATOR FOR SOCIETAL DIMENSIONS OF  
 23       NANOTECHNOLOGY.—The Director of the Office of  
 24       Science and Technology Policy shall designate an associate  
 25       director of the Office of Science and Technology Policy

1 as the Coordinator for Societal Dimensions of Nanotech-  
2 nology. The Coordinator shall be responsible for oversight  
3 of the coordination, planning, and budget prioritization of  
4 activities required by section 2(b)(10) of the 21st Century  
5 Nanotechnology Research and Development Act (15  
6 U.S.C. 7501(b)(10)). The Coordinator shall, with the as-  
7 sistance of appropriate senior officials of the agencies  
8 funding activities within the Environmental, Health, and  
9 Safety and the Education and Societal Dimensions pro-  
10 gram component areas of the Program, or any successor  
11 program component areas, ensure that the requirements  
12 of such section 2(b)(10) are satisfied. The responsibilities  
13 of the Coordinator shall include—

14           (1) ensuring that a research plan for the envi-  
15           ronmental, health, and safety research activities re-  
16           quired under subsection (b) is developed, updated,  
17           and implemented and that the plan is responsive to  
18           the recommendations of the subpanel of the Advi-  
19           sory Panel established under section 4(a) of the 21st  
20           Century Nanotechnology Research and Development  
21           Act (15 U.S.C. 7503(a)), as amended by this Act;

22           (2) encouraging and monitoring the efforts of  
23           the agencies participating in the Program to allocate  
24           the level of resources and management attention  
25           necessary to ensure that the ethical, legal, environ-

1       mental, and other appropriate societal concerns re-  
2       lated to nanotechnology, including human health  
3       concerns, are addressed under the Program, includ-  
4       ing the implementation of the research plan de-  
5       scribed in subsection (b); and

6               (3) encouraging the agencies required to de-  
7       velop the research plan under subsection (b) to iden-  
8       tify, assess, and implement suitable mechanisms for  
9       the establishment of public-private partnerships for  
10      support of environmental, health, and safety re-  
11      search.

12      (b) RESEARCH PLAN.—

13              (1) IN GENERAL.—The Coordinator for Societal  
14      Dimensions of Nanotechnology shall convene and  
15      chair a panel comprised of representatives from the  
16      agencies funding research activities under the Envi-  
17      ronmental, Health, and Safety program component  
18      area of the Program, or any successor program com-  
19      ponent area, and from such other agencies as the  
20      Coordinator considers necessary to develop, periodi-  
21      cally update, and coordinate the implementation of  
22      a research plan for this program component area. In  
23      developing and updating the plan, the panel con-  
24      vened by the Coordinator shall solicit and be respon-  
25      sive to recommendations and advice from—

1 (A) the subpanel of the Advisory Panel es-  
2 tablished under section 4(a) of the 21st Cen-  
3 tury Nanotechnology Research and Develop-  
4 ment Act (15 U.S.C. 7503(a)), as amended by  
5 this Act; and

6 (B) the agencies responsible for environ-  
7 mental, health, and safety regulations associ-  
8 ated with the production, use, and disposal of  
9 nanoscale materials and products.

10 (2) DEVELOPMENT OF STANDARDS.—The plan  
11 required under paragraph (1) shall include a de-  
12 scription of how the Program will help to ensure the  
13 development of—

14 (A) standards related to nomenclature as-  
15 sociated with engineered nanoscale materials;

16 (B) engineered nanoscale standard ref-  
17 erence materials for environmental, health, and  
18 safety testing; and

19 (C) standards related to methods and pro-  
20 cedures for detecting, measuring, monitoring,  
21 sampling, and testing engineered nanoscale ma-  
22 terials for environmental, health, and safety im-  
23 pacts.

1           (3) COMPONENTS OF PLAN.—The plan required  
2       under paragraph (1) shall, with respect to activities  
3       described in paragraphs (1) and (2)—

4           (A) specify near-term research objectives  
5       and long-term research objectives;

6           (B) specify milestones associated with each  
7       near-term objective and the estimated time and  
8       resources required to reach each milestone;

9           (C) with respect to subparagraphs (A) and  
10       (B), describe the role of each agency carrying  
11       out or sponsoring research in order to meet the  
12       objectives specified under subparagraph (A) and  
13       to achieve the milestones specified under sub-  
14       paragraph (B);

15          (D) specify the funding allocated to each  
16       major objective of the plan and the source of  
17       funding by agency for the current fiscal year;  
18       and

19          (E) estimate the funding required for each  
20       major objective of the plan and the source of  
21       funding by agency for the following 3 fiscal  
22       years.

23          (4) TRANSMITTAL TO CONGRESS.—The plan re-  
24       quired under paragraph (1) shall be submitted not  
25       later than 60 days after the date of enactment of

1 this Act to the Committee on Commerce, Science,  
2 and Transportation of the Senate and the Com-  
3 mittee on Science and Technology of the House of  
4 Representatives.

5 (5) UPDATING AND APPENDING TO REPORT.—

6 The plan required under paragraph (1) shall be up-  
7 dated annually and appended to the report required  
8 under section 2(d) of the 21st Century Nanotechnol-  
9 ogy Research and Development Act (15 U.S.C.  
10 7501(d)).

11 (c) NANOTECHNOLOGY PARTNERSHIPS.—

12 (1) ESTABLISHMENT.—As part of the program  
13 authorized by section 9 of the National Science  
14 Foundation Authorization Act of 2002, the Director  
15 of the National Science Foundation shall provide 1  
16 or more grants to establish partnerships as defined  
17 by subsection (a)(2) of that section, except that each  
18 such partnership shall include 1 or more businesses  
19 engaged in the production of nanoscale materials,  
20 products, or devices. Partnerships established in ac-  
21 cordance with this subsection shall be designated as  
22 “Nanotechnology Education Partnerships”.

23 (2) PURPOSE.—Nanotechnology Education  
24 Partnerships shall be designed to recruit and help  
25 prepare secondary school students to pursue postsec-

1       ondary level courses of instruction in nanotechnol-  
2       ogy. At a minimum, grants shall be used to sup-  
3       port—

4               (A) professional development activities to  
5       enable secondary school teachers to use cur-  
6       ricular materials incorporating nanotechnology  
7       and to inform teachers about career possibilities  
8       for students in nanotechnology;

9               (B) enrichment programs for students, in-  
10       cluding access to nanotechnology facilities and  
11       equipment at partner institutions, to increase  
12       their understanding of nanoscale science and  
13       technology and to inform them about career  
14       possibilities in nanotechnology as scientists, en-  
15       gineers, and technicians; and

16              (C) identification of appropriate nanotech-  
17       nology educational materials and incorporation  
18       of nanotechnology into the curriculum for sec-  
19       ondary school students at one or more organiza-  
20       tions participating in a Partnership.

21       (3) SELECTION.—Grants under this subsection  
22       shall be awarded in accordance with subsection (b)  
23       of such section 9, except that paragraph (3)(B) of  
24       that subsection shall not apply.

25       (d) UNDERGRADUATE EDUCATION PROGRAMS.—

1           (1) ACTIVITIES SUPPORTED.—As part of the  
2           activities included under the Education and Societal  
3           Dimensions program component area, or any suc-  
4           cessor program component area, the Program shall  
5           support efforts to introduce nanoscale science, engi-  
6           neering, and technology into undergraduate science  
7           and engineering education through a variety of  
8           interdisciplinary approaches. Activities supported  
9           may include—

10                   (A) development of courses of instruction  
11                   or modules to existing courses;

12                   (B) faculty professional development; and

13                   (C) acquisition of equipment and instru-  
14                   mentation suitable for undergraduate education  
15                   and research in nanotechnology.

16           (2) COURSE, CURRICULUM, AND LABORATORY  
17           IMPROVEMENT AUTHORIZATION.—There are author-  
18           ized to be appropriated to the Director of the Na-  
19           tional Science Foundation to carry out activities de-  
20           scribed in paragraph (1) through the Course, Cur-  
21           riculum, and Laboratory Improvement program  
22           from amounts authorized under section  
23           7002(c)(2)(B) of the America COMPETES Act,  
24           \$5,000,000 for fiscal year 2010.



1           (3) ADVANCED TECHNOLOGY EDUCATION AU-  
2           THORIZATION.—There are authorized to be appro-  
3           priated to the Director of the National Science  
4           Foundation to carry out activities described in para-  
5           graph (1) through the Advanced Technology Edu-  
6           cation program from amounts authorized under sec-  
7           tion 7002(c)(2)(B) of the America COMPETES Act,  
8           \$5,000,000 for fiscal year 2010.

9           (e) INTERAGENCY WORKING GROUP.—The National  
10          Science and Technology Council shall establish under the  
11          Nanoscale Science, Engineering, and Technology Sub-  
12          committee an Education Working Group to coordinate,  
13          prioritize, and plan the educational activities supported  
14          under the Program.

15          (f) SOCIETAL DIMENSIONS IN NANOTECHNOLOGY  
16          EDUCATION ACTIVITIES.—Activities supported under the  
17          Education and Societal Dimensions program component  
18          area, or any successor program component area, that in-  
19          volve informal, precollege, or undergraduate nanotechnol-  
20          ogy education shall include education regarding the envi-  
21          ronmental, health and safety, and other societal aspects  
22          of nanotechnology.

23          (g) REMOTE ACCESS TO NANOTECHNOLOGY FACILI-  
24          TIES.—(1) Agencies supporting nanotechnology research  
25          facilities as part of the Program shall require the entities

1 that operate such facilities to allow access via the Internet,  
2 and support the costs associated with the provision of such  
3 access, by secondary school students and teachers, to in-  
4 struments and equipment within such facilities for edu-  
5 cational purposes. The agencies may waive this require-  
6 ment for cases when particular facilities would be inappro-  
7 priate for educational purposes or the costs for providing  
8 such access would be prohibitive.

9 (2) The agencies identified in paragraph (1) shall re-  
10 quire the entities that operate such nanotechnology re-  
11 search facilities to establish and publish procedures, guide-  
12 lines, and conditions for the submission and approval of  
13 applications for the use of the facilities for the purpose  
14 identified in paragraph (1) and shall authorize personnel  
15 who operate the facilities to provide necessary technical  
16 support to students and teachers.

17 **SEC. 4. TECHNOLOGY TRANSFER.**

18 (a) PROTOTYPING.—

19 (1) ACCESS TO FACILITIES.—In accordance  
20 with section 2(b)(7) of 21st Century Nanotechnology  
21 Research and Development Act (15 U.S.C.  
22 7501(b)(7)), the agencies supporting nanotechnology  
23 research facilities as part of the Program shall pro-  
24 vide access to such facilities to companies for the  
25 purpose of assisting the companies in the develop-

1       ment of prototypes of nanoscale products, devices, or  
2       processes (or products, devices, or processes enabled  
3       by nanotechnology) for determining proof of concept.  
4       The agencies shall publicize the availability of these  
5       facilities and encourage their use by companies as  
6       provided for in this section.

7               (2) PROCEDURES.—The agencies identified in  
8       paragraph (1)—

9                       (A) shall establish and publish procedures,  
10                      guidelines, and conditions for the submission  
11                      and approval of applications for use of nano-  
12                      technology facilities;

13                     (B) shall publish descriptions of the capa-  
14                      bilities of facilities available for use under this  
15                      subsection, including the availability of tech-  
16                      nical support; and

17                     (C) may waive recovery, require full recov-  
18                      ery, or require partial recovery of the costs as-  
19                      sociated with use of the facilities for projects  
20                      under this subsection.

21               (3) SELECTION AND CRITERIA.—In cases when  
22       less than full cost recovery is required pursuant to  
23       paragraph (2)(C), projects provided access to nano-  
24       technology facilities in accordance with this sub-  
25       section shall be selected through a competitive,

1 merit-based process, and the criteria for the selec-  
2 tion of such projects shall include at a minimum—

3 (A) the readiness of the project for tech-  
4 nology demonstration;

5 (B) evidence of a commitment by the ap-  
6 plicant for further development of the project to  
7 full commercialization if the proof of concept is  
8 established by the prototype; and

9 (C) evidence of the potential for further  
10 funding from private sector sources following  
11 the successful demonstration of proof of con-  
12 cept.

13 The agencies may give special consideration in se-  
14 lecting projects to applications that are relevant to  
15 important national needs or requirements.

16 (b) USE OF EXISTING TECHNOLOGY TRANSFER PRO-  
17 GRAMS.—

18 (1) PARTICIPATING AGENCIES.—Each agency  
19 participating in the Program shall—

20 (A) encourage the submission of applica-  
21 tions for support of nanotechnology related  
22 projects to the Small Business Innovation Re-  
23 search Program and the Small Business Tech-  
24 nology Transfer Program administered by such  
25 agencies; and

1 (B) through the National Nanotechnology  
2 Coordination Office and within 6 months after  
3 the date of enactment of this Act, submit to the  
4 Committee on Commerce, Science, and Trans-  
5 portation of the Senate and the Committee on  
6 Science and Technology of the House of Rep-  
7 resentatives—

8 (i) the plan described in section  
9 2(c)(7) of the 21st Century Nanotechnol-  
10 ogy Research and Development Act (15  
11 U.S.C. 7501(c)(7)); and

12 (ii) a report specifying, if the agency  
13 administers a Small Business Innovation  
14 Research Program and a Small Business  
15 Technology Transfer Program—

16 (I) the number of proposals re-  
17 ceived for nanotechnology related  
18 projects during the current fiscal year  
19 and the previous 2 fiscal years;

20 (II) the number of such pro-  
21 posals funded in each year;

22 (III) the total number of nano-  
23 technology related projects funded and  
24 the amount of funding provided for

1                   fiscal year 2004 through fiscal year  
2                   2008; and

3                   (IV) a description of the projects  
4                   identified in accordance with sub-  
5                   clause (III) which received private sec-  
6                   tor funding beyond the period of  
7                   phase II support.

8                   (2) NATIONAL INSTITUTE OF STANDARDS AND  
9                   TECHNOLOGY.—The Director of the National Insti-  
10                  tute of Standards and Technology in carrying out  
11                  the requirements of section 28 of the National Insti-  
12                  tute of Standards and Technology Act (15 U.S.C.  
13                  278n) shall—

14                  (A) in regard to subsection (d) of that sec-  
15                  tion, encourage the submission of proposals for  
16                  support of nanotechnology related projects; and

17                  (B) in regard to subsection (g) of that sec-  
18                  tion, include a description of how the require-  
19                  ment of subparagraph (A) of this paragraph is  
20                  being met, the number of proposals for nano-  
21                  technology related projects received, the number  
22                  of such proposals funded, the total number of  
23                  such projects funded since the beginning of the  
24                  Technology Innovation Program, and the out-  
25                  comes of such funded projects in terms of the

1 metrics developed in accordance with such sub-  
2 section (g).

3 (3) TIP ADVISORY BOARD.—The TIP Advisory  
4 Board established under section 28(k) of the Na-  
5 tional Institute of Standards and Technology Act  
6 (15 U.S.C. 278n(k)), in carrying out its responsibil-  
7 ities under subsection (k)(3), shall provide the Di-  
8 rector of the National Institute of Standards and  
9 Technology with—

10 (A) advice on how to accomplish the re-  
11 quirement of paragraph (2)(A) of this sub-  
12 section; and

13 (B) an assessment of the adequacy of the  
14 allocation of resources for nanotechnology re-  
15 lated projects supported under the Technology  
16 Innovation Program.

17 (c) INDUSTRY LIAISON GROUPS.—An objective of the  
18 Program shall be to establish industry liaison groups for  
19 all industry sectors that would benefit from applications  
20 of nanotechnology. The Nanomanufacturing, Industry Li-  
21 aison, and Innovation Working Group of the National  
22 Science and Technology Council shall actively pursue es-  
23 tablishing such liaison groups.

24 (d) COORDINATION WITH STATE INITIATIVES.—Sec-  
25 tion 2(b)(5) of the 21st Century Nanotechnology Research

1 and Development Act (15 U.S.C. 7501(b)(5)) is amended  
2 to read as follows:

3 “(5) ensuring United States global leadership in  
4 the development and application of nanotechnology,  
5 including through coordination and leveraging Fed-  
6 eral investments with nanotechnology research, de-  
7 velopment, and technology transition initiatives sup-  
8 ported by the States;”.

9 **SEC. 5. RESEARCH IN AREAS OF NATIONAL IMPORTANCE.**

10 (a) IN GENERAL.—The Program shall include sup-  
11 port for nanotechnology research and development activi-  
12 ties directed toward application areas that have the poten-  
13 tial for significant contributions to national economic com-  
14 petitiveness and for other significant societal benefits. The  
15 activities supported shall be designed to advance the devel-  
16 opment of research discoveries by demonstrating technical  
17 solutions to important problems in such areas as nano-  
18 electronics, energy efficiency, health care, and water reme-  
19 diation and purification. The Advisory Panel shall make  
20 recommendations to the Program for candidate research  
21 and development areas for support under this section.

22 (b) CHARACTERISTICS.—

23 (1) IN GENERAL.—Research and development  
24 activities under this section shall—



1 (A) include projects selected on the basis  
2 of applications for support through a competi-  
3 tive, merit-based process;

4 (B) involve collaborations among research-  
5 ers in academic institutions and industry, and  
6 may involve nonprofit research institutions and  
7 Federal laboratories, as appropriate;

8 (C) when possible, leverage Federal invest-  
9 ments through collaboration with related State  
10 initiatives; and

11 (D) include a plan for fostering the trans-  
12 fer of research discoveries and the results of  
13 technology demonstration activities to industry  
14 for commercial development.

15 (2) PROCEDURES.—Determination of the re-  
16 quirements for applications under this subsection,  
17 review and selection of applications for support, and  
18 subsequent funding of projects shall be carried out  
19 by a collaboration of no fewer than 2 agencies par-  
20 ticipating in the Program. In selecting applications  
21 for support, the agencies shall give special consider-  
22 ation to projects that include cost sharing from non-  
23 Federal sources.

24 (3) INTERDISCIPLINARY RESEARCH CENTERS.—  
25 Research and development activities under this sec-

1       tion may be supported through interdisciplinary  
2       nanotechnology research centers, as authorized by  
3       section 2(b)(4) of the 21st Century Nanotechnology  
4       Research and Development Act (15 U.S.C.  
5       7501(b)(4)), that are organized to investigate basic  
6       research questions and carry out technology dem-  
7       onstration activities in areas such as those identified  
8       in subsection (a).

9       (c) REPORT.—Reports required under section 2(d) of  
10      the 21st Century Nanotechnology Research and Develop-  
11      ment Act (15 U.S.C. 7501(d)) shall include a description  
12      of research and development areas supported in accord-  
13      ance with this section, including the same budget informa-  
14      tion as is required for program component areas under  
15      paragraphs (1) and (2) of such section 2(d).

16   **SEC. 6. NANOMANUFACTURING RESEARCH.**

17       (a) RESEARCH AREAS.—The Nanomanufacturing  
18      program component area, or any successor program com-  
19      ponent area, shall include research on—

20           (1) development of instrumentation and tools  
21           required for the rapid characterization of nanoscale  
22           materials and for monitoring of nanoscale manufac-  
23           turing processes; and

1           (2) approaches and techniques for scaling the  
2       synthesis of new nanoscale materials to achieve in-  
3       dustrial-level production rates.

4       (b) GREEN NANOTECHNOLOGY.—Interdisciplinary re-  
5       search centers supported under the Program in accord-  
6       ance with section 2(b)(4) of the 21st Century Nanotech-  
7       nology Research and Development Act (15 U.S.C.  
8       7501(b)(4)) that are focused on nanomanufacturing re-  
9       search and centers established under the authority of sec-  
10      tion 5(b)(3) of this Act shall include as part of the activi-  
11      ties of such centers—

12           (1) research on methods and approaches to de-  
13      velop environmentally benign nanoscale products and  
14      nanoscale manufacturing processes, taking into con-  
15      sideration relevant findings and results of research  
16      supported under the Environmental, Health, and  
17      Safety program component area, or any successor  
18      program component area;

19           (2) fostering the transfer of the results of such  
20      research to industry; and

21           (3) providing for the education of scientists and  
22      engineers through interdisciplinary studies in the  
23      principles and techniques for the design and develop-  
24      ment of environmentally benign nanoscale products  
25      and processes.

1       (c) REVIEW OF NANOMANUFACTURING RESEARCH  
2 AND RESEARCH FACILITIES.—

3           (1) PUBLIC MEETING.—Not later than 12  
4 months after the date of enactment of this Act, the  
5 National Nanotechnology Coordination Office shall  
6 sponsor a public meeting, including representation  
7 from a wide range of industries engaged in  
8 nanoscale manufacturing, to—

9           (A) obtain the views of participants at the  
10 meeting on—

11           (i) the relevance and value of the re-  
12 search being carried out under the Nano-  
13 manufacturing program component area of  
14 the Program, or any successor program  
15 component area; and

16           (ii) whether the capabilities of nano-  
17 technology research facilities supported  
18 under the Program are adequate—

19           (I) to meet current and near-  
20 term requirements for the fabrication  
21 and characterization of nanoscale de-  
22 vices and systems; and

23           (II) to provide access to and use  
24 of instrumentation and equipment at  
25 the facilities, by means of networking

1 technology, to individuals who are at  
2 locations remote from the facilities;  
3 and

4 (B) receive any recommendations on ways  
5 to strengthen the research portfolio supported  
6 under the Nanomanufacturing program compo-  
7 nent area, or any successor program component  
8 area, and on improving the capabilities of nano-  
9 technology research facilities supported under  
10 the Program.

11 Companies participating in industry liaison groups  
12 shall be invited to participate in the meeting. The  
13 Coordination Office shall prepare a report docu-  
14 menting the findings and recommendations resulting  
15 from the meeting.

16 (2) ADVISORY PANEL REVIEW.—The Advisory  
17 Panel shall review the Nanomanufacturing program  
18 component area of the Program, or any successor  
19 program component area, and the capabilities of  
20 nanotechnology research facilities supported under  
21 the Program to assess—

22 (A) whether the funding for the Nano-  
23 manufacturing program component area, or any  
24 successor program component area, is adequate

1 and receiving appropriate priority within the  
2 overall resources available for the Program;

3 (B) the relevance of the research being  
4 supported to the identified needs and require-  
5 ments of industry;

6 (C) whether the capabilities of nanotech-  
7 nology research facilities supported under the  
8 Program are adequate—

9 (i) to meet current and near-term re-  
10 quirements for the fabrication and charac-  
11 terization of nanoscale devices and sys-  
12 tems; and

13 (ii) to provide access to and use of in-  
14 strumentation and equipment at the facili-  
15 ties, by means of networking technology, to  
16 individuals who are at locations remote  
17 from the facilities; and

18 (D) the level of funding that would be  
19 needed to support—

20 (i) the acquisition of instrumentation,  
21 equipment, and networking technology suf-  
22 ficient to provide the capabilities at nano-  
23 technology research facilities described in  
24 subparagraph (C); and

1 (ii) the operation and maintenance of  
2 such facilities.

3 In carrying out its assessment, the Advisory Panel  
4 shall take into consideration the findings and rec-  
5 ommendations from the report required under para-  
6 graph (1).

7 (3) REPORT.—Not later than 18 months after  
8 the date of enactment of this Act, the Advisory  
9 Panel shall submit to the Committee on Commerce,  
10 Science, and Transportation of the Senate and the  
11 Committee on Science and Technology of the House  
12 of Representatives a report on its assessment re-  
13 quired under paragraph (2), along with any rec-  
14 ommendations and a copy of the report prepared in  
15 accordance with paragraph (1).

16 **SEC. 7. DEFINITIONS.**

17 In this Act, terms that are defined in section 10 of  
18 the 21st Century Nanotechnology Research and Develop-  
19 ment Act (15 U.S.C. 7509) have the meaning given those  
20 terms in that section.

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